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Checking Mountain Soil Moisture Under the Snow, an important factor in snowmelt runoff.

Federal-State Cooperative
Snow Surveys and Water Supply Forecasts
Montana and Northern Wyoming
Upper Missouri,
Upper Columbia and
Yellowstone Rivers

SOIL CONSERVATION SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE
AND
MONTANA AGRICULTURAL EXPERIMENT STATION

In cooperation with the U. S. Forest Service, U. S. Geological Survey,
National Park Service, U. S. Bureau of Reclamation, State Engineers
of Montana and Wyoming and other Federal, State and local Organizations.

— AS OF —
JUN 1 1956

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY
AND WATER SUPPLY FORECAST REPORTS:

Snow surveys in the West are conducted each year at more than 1200 snow courses. Basin and Province or State snow survey reports summarizing the results of the measurements and forecasts of seasonal runoff and water supply are issued by the Soil Conservation Service, U. S. Department of Agriculture and some of its co-operators; the Water Rights Branch of the British Columbia Department of Lands and Forests; and the California Division of Water Resources.

Copies of the various federal-state cooperative snow survey reports listed below may be secured by writing to:

Head, Water Supply Forecasting Section
Soil Conservation Service
209 S. W. 5th Avenue
Portland 4, Oregon

BASIN REPORTS:

Colorado, Rio Grande,.. Issued monthly February through May by SCS and
and Platte-Arkansas Colorado Experiment Station, Fort Collins, Colorado.*
River Basins

Columbia River..... Issued monthly January through May by Soil Conserva-
tion Service, Boise, Idaho.*

Upper Missouri..... Issued monthly February through May by SCS and
River Basin Montana Agricultural Experiment Station, Bozeman,
Montana.*

West-Wide Water..... Issued April 1 by Soil Conservation Service and
Supply Outlook Cooperators, Portland, Oregon.

STATE REPORTS:

Arizona..... Issued semi-monthly January 15 through April 1 by SCS
and Salt River Valley Water Users Association, Phoenix,
Arizona.*

Nevada..... Issued monthly February through April by SCS and
Nevada State Engineer, Reno, Nevada.*

Oregon..... Issued monthly January through May by SCS, Portland,
Oregon, and Oregon Agricultural Experiment Station.*

Utah..... Issued monthly January through May by SCS, Salt Lake
City, Utah, and State Engineer of Utah and Utah Agri-
cultural Experiment Station.*

Washington..... Issued monthly February through May by SCS, Spokane,
Washington, and State Department of Conservation and
Development.*

Wyoming..... Issued monthly February through May by SCS, Casper,
Wyoming, and State Engineer of Wyoming.*

*Special reports are issued as needed.

The British Columbia reports are issued February 1 through June 1 and may be
secured from Comptroller, Water Rights Branch, Department of Lands and Forests,
Parliament Buildings, Victoria, B.C.

The California reports are issued monthly February 1 through May 1 and may be
secured from Division of Water Resources, California Department of Public
Works, Sacramento, California.

The annual water supply forecasts of the Weather Bureau are available in monthly
bulletins published from January through May. These bulletins entitled, "Water
Supply Forecasts for the Western United States" may be obtained from River Fore-
cast Center, Weather Bureau, 712 Federal Office Building, Kansas City 6,
Missouri.

UNITED STATES
DEPARTMENT OF AGRICULTURE
Soil Conservation Service

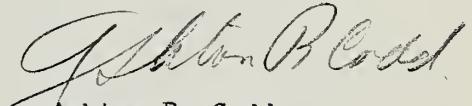
MONTANA SNOW SURVEYS

WATER SUPPLY OUTLOOK
June 1, 1956
Special Report

Snow survey measurements made on or about June first on high elevation courses on the Kootenai, Flathead and Clark Fork tributaries to the Columbia River, indicate that considerable snow is still left in the mountains to run off. North and east facing slopes at higher elevations are still heavily loaded with unmelted snow.

A few comparisons of past years are tabulated to indicate that other years as 1950 and 1954 had as much or more snow water content on June first. Late spring measurements have not been made every year and comparisons are few.

Stream-flow forecasts for June first have not been modified over those issued on May first.



Ashton R. Codd
Snow Survey Supervisor
Montana State College

MONTANA SNOW SURVEYS - JUNE 1, 1956

COLUMBIA BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	SNOW COVER MEASUREMENTS			Past Record Water Content	As Noted	Total Years of Record
				1956 Snow Depth (In.)	Water Content (In.)	As Noted			

KOOTENAI RIVER (above Libby, Montana)

							(1951)	(1950)	
Blue Bird	14A1	6800	5/31	Est.	24.0		35.4 (1950)	42.3 (1954)	30.9
Brush Creek	14A4	5000	6/1	0	0		2.1 (1954)	0 (1951)	--
Gray Creek	Can	5100	5/30	13	5.3		14.4 (1950)	11.2 (1954)	9.2
Marble Canyon	Can	5000	5/31	0	0		6.5 (1950)	6.3 (1954)	4.3
Red Mountain	15A1	6000	5/29	13	6.6		15.4	13.2	--
Weasel Divide	14A7	5250	5/31	40	22.1		--	--	--

FLATHEAD RIVER

							(1954)	(1950)	
Big Creek	13B3	6750	6/1	53	32.1		34.4 (1951)	58.1 (1950)	41.9
Blue Bird	14A1	6800	5/31	Est.	24.0		35.4 (1954)	42.3 (1950)	30.9
Brush Creek	14A4	5000	6/1	0	0		0 (1954)	2.1 (1950)	--
Desert Mountain	13A2	5600	6/1	0	0		0 (1954)	5.2 (1950)	--
N. Fork Jocko	13B7	6330	5/30	42	24.6		30.2 (1950)	44.6 (1950)	27.5
Spotted Bear Mt.	13B2	7000	6/1	0	0		--	0	--
Weasel Divide	14A7	5250	5/31	40	22.1		--	--	--

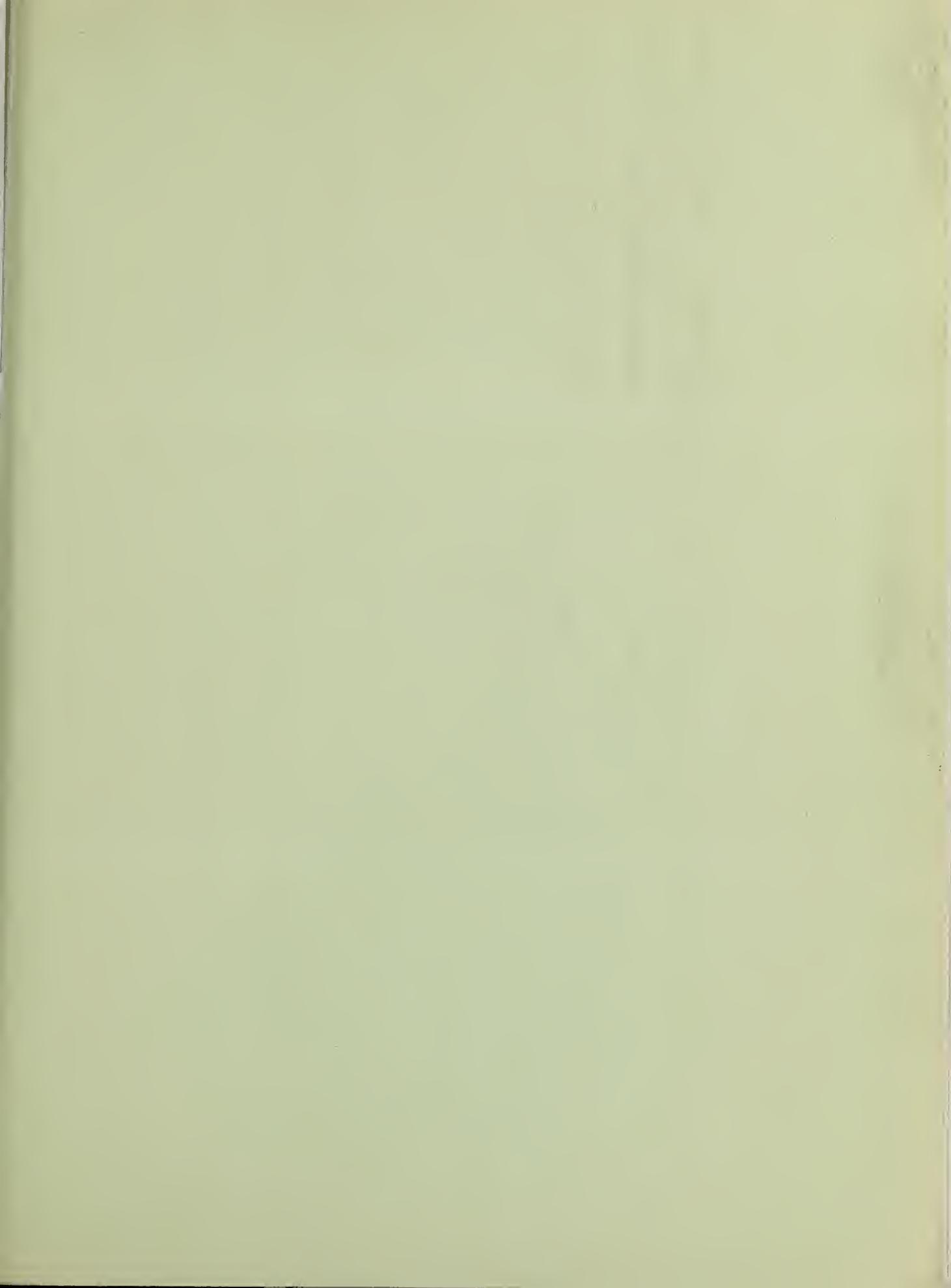
UPPER CLARK FORK

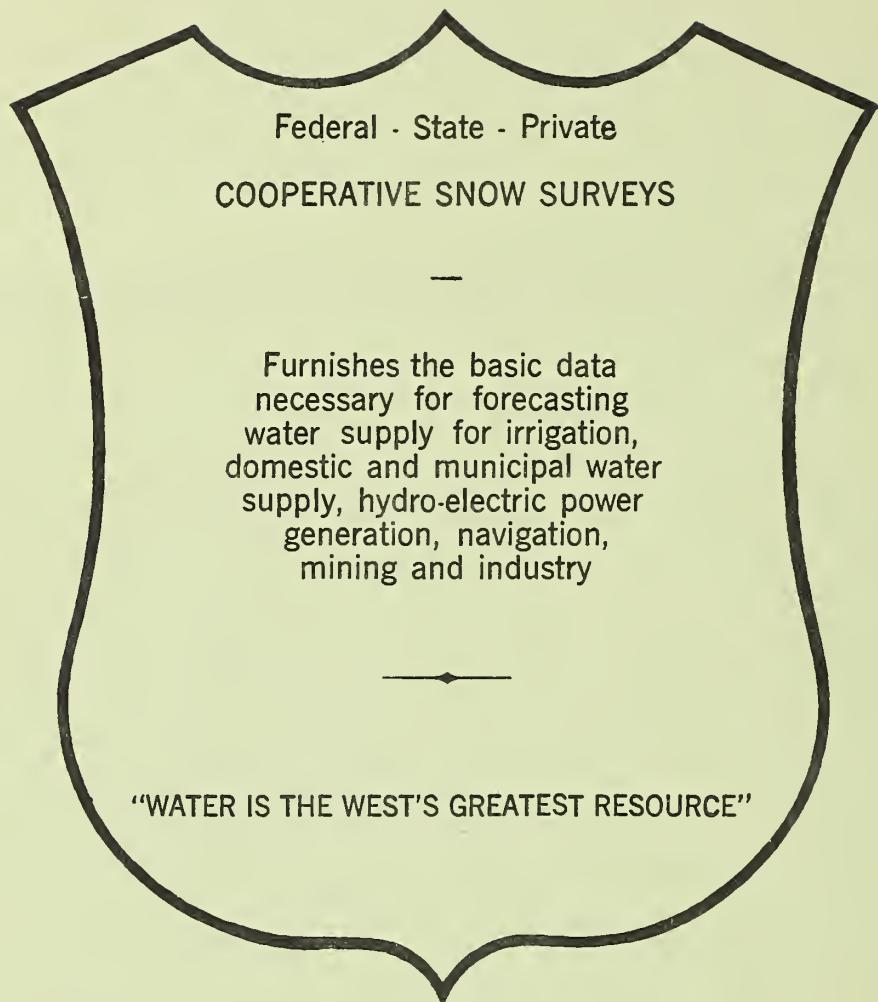
							(1951)	(1950)	
**Lookout	15B2	5250	6/1	12	7.4		2.8	22.7	--

BITTERROOT

							(1954)	(1950)	
Gibbons Pass	13D2	7100	5/31	10	5.0		1.3 (1953)	23.9 (1950)	11.0
Nezperce Pass	14D1	6575	6/1	0	0		6.8 (1954)	1.4 (1950)	4.1
Nezperce Camp	14D2	5580	6/1	0	0		0 (1954)	0 (1950)	--

**Adjacent Basin



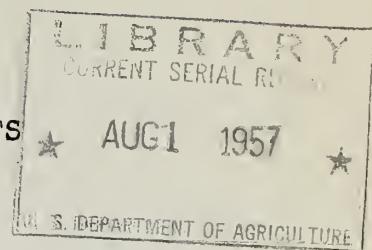


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Reserve

Jan. 1, 1957

FEDERAL - STATE COOPERATIVE
SNOW SURVEYS and WATER SUPPLY FORECASTS
for
MONTANA AND NORTHERN WYOMING
(Upper Missouri and Upper Columbia River Basins)



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Soil Conservation Service
U. S. Department of Agriculture
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Montana Agricultural Experiment Station
Bozeman, Montana

Report issued by:

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M. M. Kelso, Director
Montana Agricultural
Experiment Station

WATER SUPPLY OUTLOOK
from
SNOW SURVEYS
January 1, 1957

MISSOURI BASTIN

The 1957 January first snow-pack in the higher elevations is average or better, with the lower elevation courses showing considerably below average. In general, this year's snow-pack is roughly 75 per cent of last year and about twice that of 1955.

This year the Upper Yellowstone River is covered with a snow-pack slightly below average. This year's pack is about twice that of 1955 and about a third less than last year.

COLUMBIA BASIN

In the Flathead River Basin the 1957 January first snow-pack is considerably lighter than 1956 and about 20 per cent less than the average of a short record. Only six courses were measured this season. This year's snow-pack is considerably better than January, 1955. Fall (Sept-Nov) precipitation was below average by 1.78 inches with close to average precipitation during December.

The 1957 January snow-pack on the Clark Fork Basin is only 58 per cent of last year's pack, and about 75 per cent average. The 1955 January snow-pack was considerably less than this year. Fall (Sept-Nov) precipitation this year was 1.54 inches less than average, with close to normal precipitation during December.

MONTANA SNOW SURVEYS - JANUARY 1, 1957

MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	1957 Snow Depth (In.)	Water Content (In.)	SNOW COVER MEASUREMENTS				Total Years of Record
						1956	1955	15-Year Average 1938-52		
<u>JEFFERSON RIVER</u>										
(Rock-Beaverhead)										
*Kilgore	11E12	6200	1/2	20	3.8	3.6	-	4.6	17	
Camp Creek	12E3	6800	1/7	27	3.5	4.5	-	4.0	19	
(Big Hole)										
Gibbons Pass	13D2	7100	12/31	42	11.2	19.5	5.5	11.2*	7	
<u>MADISON RIVER</u>										
Hebgen	11E5	6500	1/2	31	6.6	7.1	1.8	5.6	22	
W. Yellowstone	11E7	6700	1/2	24	5.6	8.9	2.1	4.1*	19	
21-Mile	11E6	7150	1/3	35	9.0	15.0	3.0	7.7*	18	
**Big Springs	11E9	6500	1/29	37	9.5	11.8	3.3	7.4	21	
**Island Park	11E10	3600	12/30	31	7.2	9.0	2.4	6.0	21	
**Valley View	11E8	6500	12/30	30	6.7	9.7	1.2	5.2*	20	
Norris Basin	10E2	7500	12/31	21	4.9	7.7	-	3.6*	3	
<u>GALLATIN RIVER</u>										
21-Mile	11E6	7150	1/3	35	9.0	15.0	3.0	7.7*	18	
<u>MISSOURI RIVER MAIN STEM</u>										
Chessman Res.	12C5	6200	12/31	0.5	0.1	3.6	0.9	2.1	21	
Tenmile, Lower	12C2	6250	12/28	10	2.2	5.4	1.5	2.8	21	
Tenmile, Middle	12C3	6800	12/28	16	3.9	8.3	2.7	5.0	22	
Tenmile, Upper	12C4	8000	12/28	20	5.2	9.8	3.7	6.5	22	
(Marias River)										
Marias Pass	13A5	5250	1/2	30	8.4	8.8	4.2	7.8	22	
<u>UPPER YELLOWSTONE</u>										
Canyon	10E3	7750	12/31	29	6.5	13.5	3.8	7.1*	11	
Cooke City	10D7	7400	12/30	19	3.5	5.9	3.2	4.5*	10	
Lake Camp	10E4	7850	1/1	17	3.4	10.2	1.8	5.0*	8	
**Astor Creek	10E8	7700	12/31	40	11.3	27.3	6.4	-	5	
**Tom Thumb Summit	10E7	7900	12/31	30	8.3	-	-	13.6*	5	
<u>LOWER YELLOWSTONE (Shoshone River)</u>										
East Entrance	10E6	7000	12/29	24	5.5	6.2	1.3	-	3	
Sylvan Pass	10E5	7100	12/28	27	6.6	10.3	2.4	-	3	

*Average is for less than 15 years of record in the 1938-52 period.

**Adjacent Basin.

MONTANA SNOW SURVEYS - JANUARY 1, 1957

COLUMBIA BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	SNOW COVER MEASUREMENTS				Total Years of Record
				1957	Snow Depth (In.)	Water Content (In.)	Past Record Water Content	
				1956	1955	15-Year Average 1938-52		
<u>FLATHEAD RIVER</u>								
Coyote Hill	13B10	4200	1/3	19	4.8	7.0	2.8	8.0*
Desert Mountain	13A2	5600	1/6	30	6.4	8.5	2.7	7.2*
Marias Pass	13A5	5250	1/2	30	8.4	8.8	4.2	7.8
Spotted Bear Mt.	13B2	7000	1/4	25	5.9	7.9	-	-
Trout Lake	13A12	3600	1/3	23	4.9	6.6	-	13.3*
Twin Creeks	13B11	3580	1/3	18	3.5	4.8	-	-
<u>CLARK FORK BASIN</u>								
Coyote Hill	13B10	4200	1/3	19	4.8	7.0	2.8	8.0*
Chessman Res.	12C5	6200	12/31	0.5	0.1	3.6	0.9	2.1
Lubrecht Forest #6	13C8	5400	1/2	4.0	1.1	3.7	0.8	4.0*
Storm Lake #2	13C7	7780	1/4	27	6.0	10.6	-	-
Tenmile, Lower	12C2	6250	12/28	10	2.2	5.4	1.5	2.8
Tenmile, Middle	12C3	6800	12/28	16	3.9	8.3	2.7	5.0
Tenmile, Upper	12C4	8000	12/28	20	5.2	9.8	3.7	6.5
**Lookout	15B2	5250	1/2	53	15.6	27.0	10.9	21.1*
TV Mountain	14B1	6800	12/31	31	8.2	-	-	-
<u>BITTERROOT BASIN</u>								
Gibbons Pass	13D2	7100	12/31	42	11.2	19.5	5.5	12.0*
								7

*Average is for less than 15 years of record in the 1938-52 period.

**Adjacent Basin.

STATUS OF RESERVOIR STORAGE
MISSOURI RIVER IN MONTANA
January, 1957

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000's AF	THOUSAND ACRE FEET IN STORAGE			
			ABOUT JANUARY FIRST			15-Yr.Avg. 1938-52
			1957	1956	1955	
<u>MISSOURI RIVER BASIN</u>						
Beaverhead	Lima	84.00	8.23	18.18	11.75	36.645*
Ruby River	Ruby	38.85	-	-	-	-
Madison River	Hebgen Lake	345.00	157.1	184.90	167.50	241.652
Madison River	Ennis Lake	41.00	38.35	31.70	38.16	34.123
Hyalite Creek	Middle Creek	8.03	2.45	3.06	4.23	3.690*
Missouri River	Canyon Ferry	2,043.00	1,742.0	1,646.0	1,311.0	-
Missouri River	Hauser & Helena	62.50	61.94	60.18	55.09	46.11 *
Missouri River	Lake Helena	10.45	10.24	9.62	7.90	6.23 *
Missouri River	Holter Lake	81.92	73.97	50.58	62.19	58.44
N. Fk. Sun River	Gibson	105.00	35.04	69.21	63.95	55.07
N. Fk. Sun River	Willow Cr.	32.30	22.87	26.68	24.10	12.47
Marias	Tiber Res.	1,316.00	-	28.22	-	-
Birch Creek	Swift	30.00	19.85	20.99	24.48	18.23
Dupuyer & Birch	Lake Francis	112.00	89.96	92.46	95.31	72.53
Judith River	Ackley Lake	5.82	-	4.15	4.58	4.24
Missouri River	Ft. Peck	19,000.00	5,514.0	4,677.0	9,314.0	9,904.26
Milk River	Fresno	127.20	80.24	69.55	77.22	55.81
Milk River	Nelson	66.80	55.10	41.39	50.64	29.57
W. Rosebud Cr.	Mystic Lake	20.80	10.62	9.48	7.89	11.09
Red Lodge Cr.	Cooney	27.50	-	-	-	9.56 *
Tongue River	Tongue River	73.90	-	-	7.00	8.18 *
Swiftcurrent Cr.	Sherburne Lake	66.10	15.00	19.05	16.98	17.27
<u>MISSOURI RIVER BASIN - WYOMING</u>						
Shoshone River	Buffalo Bill	440.00	173.0	139.7	145.8	270.8
Wind River	Boysen	408.60	271.8	81.9	339.6	-
Wind River	Pilot Butte	31.6	9.1	11.7	9.2	12.88
Bull Creek	Bull Lake	152.00	84.9	72.6	66.3	63.64 *
Belle Fourche	Key Hole	190.00	11.3	18.1	-	-
<u>MISSOURI RIVER BASIN - NORTH DAKOTA</u>						
Heart River	Heart Butte	54.80	44.9	46.8	51.8	43.5 *
Heart River	Dickerson	4.30	3.2	3.0	2.5	3.97 *
Missouri River	Garrison Lk	13,805.00	595.0	524.0	239.0	-
<u>MISSOURI RIVER BASIN - SOUTH DAKOTA</u>						
Belle Fourche	Belle Fourche	185.00	23.0	69.8	-	-
Cheyenne River	Angostura	160.00	23.9	77.2	-	-
Cheyenne River	Deerfield	15.1	7.7	9.7	-	-
Grand River	Shadehill	84.00	76.4	71.0	-	-
Missouri River	Ft. Randall	2,401.60	552.7	1,629.1	-	-

*Average is for less than 15 years of record in the 1938-52 period.

STATUS OF RESERVOIR STORAGE
 COLUMBIA RIVER IN MONTANA
 January, 1957

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000's AF	THOUSAND ACRE FEET IN STORAGE			
			ABOUT JANUARY FIRST 1957	1956	1955	15-Yr.Avg. 1938-52
COLUMBIA RIVER BASIN						
Flint Creek	Georgetown Lk	31.00	22.75	23.77	24.38	23.49
S. Fk. Flathead <u>5/</u>	Hungry Horse	3,500.00	2,538.0	3,029.0	2,701.0	1,426.9 *
Flathead River	Flathead Lk	1,791.00	1,126.0	925.5	1,109.0	935.0
Flathead River <u>6/</u>	Camas Res.	42.80	29.04	33.80	38.10	17.12 *
Flathead River <u>7/</u>	Mission Valley	98.60	24.15	28.64	54.55	32.45 *
Jocko Creek	Lower Jocko Lk	7.6	.505	Snowbound		

5/ 4-year average

6/ Camas Reservoirs are shown as a sum of (4) small reservoirs on the west side of Flathead Lake located on Dry Creek and Little Bitterroot River.

7/ Mission Valley Reservoirs are shown as a sum of (8) small reservoirs located south and east of Flathead Lake. Both Camas and Mission Valley reservoirs are operated by the Indian Irrigation Service.

* Average is for less than 15 years of record in the 1938-52 period.

